

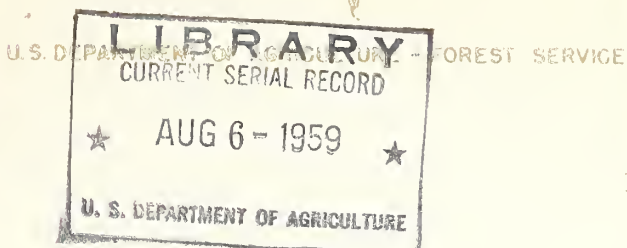
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FOREST RESEARCH NOTES

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RECENT TRIALS WITH 2,4-D AND 2,4,5-T TO KILL BRUSH IN THE SIERRA NEVADA IN CALIFORNIA

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Brush competition is one of the more serious obstacles to survival of both planted and naturally established trees in California. Brush has taken over many cutover and burned areas. In the western Sierra Nevada alone, 1.7 million acres of commercial forest land are classified as poorly stocked or non-stocked. 1/ All of this area is capable of producing forest trees, but brush dominates most of the ground and greatly hinders efforts by man and nature to reestablish conifers in adequate numbers. If these acres are to produce timber within a reasonable period, the brush must be either eradicated or killed in place. Chemical sprays offer one possibility for killing brush. This report describes the results of several experiments with two selective herbicides tested against five different brush species on the Stanislaus Experimental Forest.

Experimental Trials

Five experiments were designed to determine the effect of herbicides applied as foliage sprays at different times during the summer and fall on brush sprouts and old plants. The species studied were: Mountain whitebark (*Ceanothus cordulatus* Kell.), Sierra evergreen-shinkapio (*Castanopsis sempervirens* Dull.), bearmat (*Chamaebatia foliolosa* Benth.), littleleaf ceanothus (*Ceanothus parvifolius* Trel.), and greenleaf manzanita (*Arctostaphylos patula* Greene). The herbicides used were low volatile esters of 2,4-D (2,4-Dichlorophenoxyacetic acid) and 2,4,5-T (2,4,5-Trichlorophenoxyacetic acid). Also tested were two substances, Emul 20 (polyoxyethylene sorbitan monolaurate) and Carbowax 1500 (an emulsified wax), as possible adjuvants to increase the

1/ Forest Survey Staff. Forest Statistics for California. California Forest and Range Expt. Sta. Forest Survey Release 25. 60 pp. 1954.

Table 1.- Percent foliage kill, crown reduction, and total kill by 2,4-D and 2,4,5-T sprayed on several brush species at various dates in 1950

Species and age of plants	Date sprayed	Maximum foliage killed	Crown area reduction, 1955	Entire plant killed, 1955			
		2,4-D : 2,4,5-T	2,4-D : 2,4,5-T	2,4-D : 2,4,5-T			
		Percent					
Mountain white-thorn:							
Young sprouts	6-30	100	92	100	80	100	80
	7-27	96	98	40	60	40	60
	8-23	96	96	50	80	40	80
	9-27	90	100	20	60	20	60
	11-10	84	100	0	80	0	80
Old plants	6-30	94	98	20	30	20	0
	7-27	82	100	20	36	0	20
	8-23	100	100	40	54	0	20
	9-27	90	100	16	18	0	0
	11-10	44	100	20	58	0	20
Sierra evergreen-chinkapin:							
Young sprouts	6-30	100	100	0	0	0	0
	7-26	56	90	8	42	0	20
	8-23	60	98	32	64	20	60
	9-27	28	100	0	90	0	60
	11-10	56	100	2	90	0	0
Old plants	6-30	46	98	10	38	0	0
	7-26	96	100	18	48	0	0
	8-23	56	100	16	68	0	0
	9-27	58	100	18	90	0	20
	11-10	20	94	0	22	0	0
Smallleaf manzanita:							
Old plants	7-3	90	100	76	95	60	90
	8-7	85	97	71	87	50	50
	8-24	95	96	94	90	70	50
	9-28	100	100	100	85	100	40
	11-10	97	100	95	91	90	60
Littleleaf manzanita:							
Old plants	7-3	84	100	84	100	60	100
	8-7	100	100	100	100	100	100
	8-24	100	100	100	100	100	100
	9-28	43	100	43	100	30	100
	11-10	48	100	48	100	30	100

Table 2.--Maximum foliage kill, crown reduction, and total kill of Sierra evergreen-chinkapin sprayed in 1950 with 2,4-D and 2,4,5-T at 5 different times during the day

Time sprayed	Maximum foliage killed		Crown area reduction, 1955		Entire plant killed, 1955	
	2,4-D	2,4,5-T	2,4-D	2,4,5-T	2,4-D	2,4,5-T
Percent						
7:00 to 8:30 a.m.	97	99	40	76	20	30
9:30 to 11:00 a.m.	88	99	31	64	10	40
12:00 to 1:30 p.m.	58	98	19	38	10	10
2:30 to 4:00 p.m.	58	94	5	41	0	0
5:00 to 6:30 p.m.	92	99	41	51	10	20

Table 3.--Maximum foliage kill, crown reduction, and total kill of mountain whitethorn sprouts sprayed with two adjuvants and herbicides in 1950

Treatment	Maximum foliage killed		Crown area reduction, 1955		Entire plant killed, 1955	
	2,4-D	2,4,5-T	2,4-D	2,4,5-T	2,4-D	2,4,5-T
Percent						
Control:						
2,4-D	99		25		20	
2,4,5-T	100		80		80	
Tween 20:						
2,4-D	98		28		20	
2,4,5-T	100		74		68	
Carbowax 1500:						
2,4-D	91		28		24	
2,4,5-T	100		79		76	

